

Amendment Under 37 C.F.R. §1.116  
Application No. 10/735,844  
Attorney Docket No. 032190

### **REMARKS**

Claims 1, 3-5 and 8-19 are currently pending. As set forth in further detail below, the present amendment places the application in condition for allowance and entry is respectfully requested.

#### **I. The Art Rejections**

Claims 1, 4, and 11-19 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Kronholm et al.

Claims 1, 3-5 and 11-19 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Yoshikawa et al in view of Howard et al and Kronholm et al.

Claims 1, 3-5 and 8-19 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Alford et al. (2003/0041732) and Kronholm et al. (2004/0057896).

Claim 3 is rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Alford et al and Kronholm et al as applied to claim 1 above, and further in view of Howard et al.

Claim 4 is rejected under 35 U.S.C. §103(a) as being unpatentable over Alford et al. (2003/0041732) and Kronholm et al. (2004/0057896) as applied to claim 1 above, and further in view of Mueller et al. (5,458,742).

Applicants respectfully submit that the present invention is not rendered obvious over the disclosures of the cited art and request that the Examiner reconsider and withdraw this rejection in view of the following remarks.

The Advisory Action indicates that the Amendment filed March 19, 2007 was entered, but that claims 1, 3-5 and 8-19 remain rejected. In particular, the Examiner states that the rejection is maintained because “swirling is allowed, but not required.”

Applicants have amended claim 1 to more positively state the gas flow by reciting “the piping passage causing the gas flow ...”.

The Examiner also states that “no difference is seen between pipe 240 of Kronholm versus the instant pipe 18” and “no unexpected results are shown.”

Applicants’ respectfully traverse the Examiner’s position. FIGS. 2-5 of Kronholm et al. (US 2004/0057896 A1) show a conduit 240. The conduit 240 shown in FIGS. 2-4, where a gas flow from which soot is removed by a gas/solid separator 230 passes, provides residence time for the gas under controlled conditions for known fullerene production, e.g., temperature, gas velocity, etc. However, Kronholm et al. does not disclose swirling the gas flow passing through the conduit 240. According to a system shown in FIG. 5, a loop 510 which approximates a cyclone separator is provided downstream of the conduit 240 (paragraph [0076]). In the loop 510, the particle-laden air is subject to centrifugal forces which direct particles radially outward and thereby separate the particles based upon their Stokes number in the gas stream and the gas velocity and physical dimensions of the cyclone. Thus, in Kronholm, the cyclone separator is provided to separate particles from the gas, but not to cool the gas to polish the inner surface of the conduit 240 or to bring the gas flow into contact with the inner surface of the entire conduit 240 to promote cooling of the gas flow.

According to the present invention, the soot-containing gas flow discharged from the exhaust port of the reactor enters the piping passage 18 in a direction tangential to the piping passage 18 to generate a swirling flow inside the piping passage 18.

In this manner, the interior surface of the piping passage 18 is polished by soot and the other solids contained in the swirling flow to prevent solids such as the soot from adhering to the inner surface of the piping passage 18.

The gas flow is positively brought into contact with the inner surface of the water-cooled piping passage 18, thereby increasing overall heat transfer coefficient (cooling capacity).

As a result, cooling of the gas flow is promoted and the piping passage 18 can be reduced in length.

In conclusion, differences between the conduit 240 of Kronholm et al. and the piping passage 18 of the present invention are:

- (1) The soot-containing gas flow discharged from the reactor is directly supplied to the piping passage 18 in the present invention, whereas the gas/solid separator 230 is provided upstream of the conduit 240 of Kronholm et al. to remove solids such as soot.
  - (2) The gas flows in a swirl in the entire piping passage 18 of the present invention from upstream through downstream, whereas the loop 510 disposed downstream of the conduit 240 is provided to separate particles from the gas flow but not to generate a swirl in the entire conduit 240. Provision of the loop 510 downstream of the conduit 240 does not cause a swirl.
- For the above reasons, Applicants respectfully submit that the present invention is not taught

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by Kronholm, alone or in view of the other cited art.

For the above reasons, it is respectfully submitted that the subject matter of the pending claims is neither taught by nor made obvious from the disclosures of the cited art, alone or in combination and it is requested that the rejections under 35 U.S.C. §103(a) be reconsidered and withdrawn.

## **II. Formal Matters - The IDS Filed November 21, 2006**

The Examiner has not considered the references cited in the IDS filed November 21, 2006. On page 6 of the Office Action, the Examiner handwrote “the JP Office Action was not found.”

The filing receipt for the IDS, which is date stamped by the USPTO, lists the filing of the “foreign communication,” signifying receipt by the USPTO of the Japanese Office Action was submitted with the Amendment filed March 19, 2007.

Again, the USPTO “PAIR” system lists each of the documents 1-9 (documents 3, 8 and 9 of the IDS are listed twice, once for the Japanese document and once for the English abstract) and lists two additional documents as “non-patent literature (NPL)” documents. Applicants’ IDS listed two non-patent literature (NPL) type documents, the Japanese Office Action and the Zakharov article. It is not possible for Applicants’ representative to view the two non-patent literature documents (NPL), but it appears clear that one is the Japanese Office Action and other is the Zakharov article.

Again, the documents submitted have English language abstracts, translations and identified English language corresponding documents. The cited documents can be reviewed on that basis. That is, the IDS is proper even if the Japanese Office Action is not included.

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In view of the above, the Examiner is requested to consider the references of the IDS filed November 21, 2006 and to return an initialed PTO Form SB08.

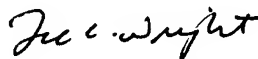
**III. Conclusion**

In view of the above, Applicants respectfully submit that their claimed invention is allowable and ask that the rejections under 35 U.S.C. §103 be reconsidered and withdrawn. Applicants respectfully submit that this case is in condition for allowance and allowance is respectfully solicited.

If any points remain at issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the local exchange number listed below.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,  
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